

REMARKS

The Office Action mailed February 5, 2004 has been reviewed and carefully considered. Claim 11 has been amended into independent form as claim 7. Claims 7-10 and 12-14 remain pending in the application, of which the independent claim is 7. Reconsideration of the above-identified application, as herein amended and in view of the following remarks, is respectfully requested.

The title is has been amended to be more descriptive of the invention.

Claims 7-14 stand rejected under 35 U.S.C. 103(a) as unpatentable over applicants' allegedly admitted prior art (AAPA) over U.S. Patent No. 5,877,040 and Japanese Patent Publication No. JP361280686A to Tanaka.

Original claim 7 recites:

forming a buffer layer, a light-absorbing layer, and an epitaxial layer in sequence on a substrate;
selectively etching the epitaxial layer of an active region to form a convex-lens-shape surface;
forming a dielectric layer on an upper surface of the epitaxial layer excluding the active region;
performing a diffusion process using the dielectric layer as a diffusion mask to form a diffusion layer on the active region of the convex-lens-shape surface;
forming a first metal electrode on an upper surface of the dielectric layer;
and,
forming a second metal electrode on an under surface of the substrate.

At page 2, the Office Action suggests that the etching step is all that is missing from AAPA, and apparently suggests that only because of the non-presence of

convex-lens-shape.

The applicants submit, firstly, that the AAPA does not disclose or suggest the last two forming steps, at least because there is no disclosure or suggestion of a “metal electrode.” Referring to the applicants’ FIGs. 1 and 2, the p-type electrode 7 is a semiconductor, whereas metal is a conductor. Therefore the p-type electrode is not a “metal electrode.” Likewise the n-type electrode 10 is not a “metal electrode.” In addition, the micro-lens 8 is transparent (specification, page 3, lines 3-4), and is not a “metal electrode.”

Nor do any of the other applied references disclose or suggest a “metal electrode,” much less offer any reason for substituting metal electrodes for the AAPA electrodes. The applied references fail to render original claim 7 obvious at least for this reason.

For purposes of prosecution efficiency, claim 11 has been amended into independent form as the new claim 7.

Claim 7 therefore now further provides, “wherein the step of forming a diffusion layer on the active region in a convex-lens shape is performed in more than two steps by dividing the diffusion area into more than one separate area.”

Despite the aforementioned statement in item 2 of the Office Action that the AAPA discloses practically everything, the applicants fail to see any disclosure or suggestion in the AAPA of “dividing the diffusion area into more than one separate area.”

Moreover, neither Park nor Tanaka offers any disclosure or suggestion of

the two separate areas.

In particular, none of the applied references, alone or in combination, feature, disclose or suggest, “wherein the step of forming a diffusion layer on the active region in a convex-lens shape is performed in more than two steps by dividing the diffusion area into more than one separate area,” which language explicitly appears in claim 7.

For at least all of the above reasons, the applied prior art references fail to render obvious the invention as recited in claim 7.

Regarding the remaining claims, each depends from claim 7 and is likewise deemed to be obvious at least due to its dependency, although each warrants further consideration based on its additional, individual merits.

In view of the foregoing amendments and remarks, it is believed that this application is now in condition for allowance. The Examiner is invited to contact the undersigned in the event of any perceived outstanding issues so that passage of the case to issue can be effected without the need for a further Office Action.

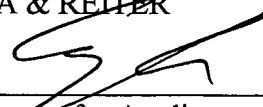
Amendment
Serial No. 10/346,315

Docket No. 5000-1-332 DIV.

In the event that any additional fee is required to continue the prosecution of this Application as requested, please charge such fee to Deposit Account No. 502-470.

Respectfully submitted,

CHA & REITER



Attorney for Applicants

Date: 5/4/04

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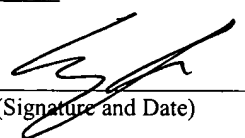
Steve S. Cha
CHA & REITER, LLC
210 Route 4 East, #103
Paramus, New Jersey 07652
Phone: (201)226-9245
Fax: (201)226-9246

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